Complete Summary

GUIDELINE TITLE

ACR Appropriateness Criteria™ for follow-up examinations for bone tumors, soft-tissue tumors, and suspected metastasis post therapy.

BIBLIOGRAPHIC SOURCE(S)

American College of Radiology (ACR), Expert Panel on Musculoskeletal Imaging. Follow-up examinations for bone tumors, soft-tissue tumors, and suspected metastasis post therapy. Reston (VA): American College of Radiology (ACR); 2002. 10 p. (ACR appropriateness criteria). [32 references]

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

- Bone tumors
- Soft-tissue tumors
- Suspected metastasis post therapy

GUIDELINE CATEGORY

Diagnosis
Evaluation

CLINICAL SPECIALTY

Oncology
Radiology

INTENDED USERS

Health Plans
Hospitals
Managed Care Organizations
Physicians
Utilization Management

GUIDELINE OBJECTIVE(S)

To evaluate the appropriateness of follow-up radiologic examinations for bone tumors, soft-tissue tumors, and suspected metastasis post therapy

TARGET POPULATION

- Patients with bone tumors
- Patients with soft-tissue tumors
- Patients with suspected metastasis post therapy

Note: these guidelines are not intended for use in the following patients:

- Patients with routine metastatic disease from other primaries
- Patients with head and neck tumors
- Patients with spine tumors
- Patients with chest wall tumors
- Patients with multiple myeloma
- Patients evaluated for chemotherapy or radiation therapy effectiveness, preoperatively after such induction therapy
- Patients with benign or nonaggressive bone or soft-tissue tumors

INTERVENTIONS AND PRACTICES CONSIDERED

1. Timing, frequency, and duration of follow-up examinations
2. Plain radiograph
    - Chest x-ray
3. Computed tomography (CT)
    - Computed tomography with or without contrast
4. Positron emission tomography fluorodeoxyglucose (PET-FDG)
5. Bone scan
6. Magnetic resonance imaging (MRI)
    - MRI with or without contrast
    - MRI with dynamic contrast study
7. Ultrasound (US)
    - Ultrasound with color Doppler flow imaging

MAJOR OUTCOMES CONSIDERED

Utility of radiologic examinations in differential diagnosis

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The guideline developer performed literature searches of recent peer-reviewed medical journals, primarily using the National Library of Medicine's MEDLINE database. The developer identified and collected the major applicable articles.

NUMBER OF SOURCE DOCUMENTS

The total number of source documents identified as the result of the literature search is not known.

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Expert Consensus (Delphi Method)
Weighting According to a Rating Scheme (Scheme Not Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

One or two topic leaders within a panel assume the responsibility of developing an evidence table for each clinical condition, based on analysis of the current literature. These tables serve as a basis for developing a narrative specific to each clinical condition.

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus (Delphi)

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Since data available from existing scientific studies are usually insufficient for meta-analysis, broad-based consensus techniques are needed to reach agreement in the formulation of the Appropriateness Criteria. Serial surveys are conducted by distributing questionnaires to consolidate expert opinions within each panel. These questionnaires are distributed to the participants along with the evidence table and narrative as developed by the topic leader(s). Questionnaires are completed by the participants in their own professional setting without influence of the other members. Voting is conducted using a scoring system from 1-9, indicating the least to the most appropriate imaging examination or therapeutic procedure. The

survey results are collected, tabulated in anonymous fashion, and redistributed after each round. A maximum of three rounds is conducted and opinions are unified to the highest degree possible. Eighty (80) percent agreement is considered a consensus. If consensus cannot be reached by this method, the panel is convened and group consensus techniques are utilized. The strengths and weaknesses of each test or procedure are discussed and consensus reached whenever possible.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Criteria developed by the Expert Panels are reviewed by the American College of Radiology (ACR) Committee on Appropriateness Criteria and the Chair of the ACR Board of Chancellors.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Foreword

Questions of musculoskeletal tumor follow-up require decisions on both method and timing of follow-up, for both local recurrence and metastatic disease.

- Variant 1 addresses modality and timing of follow-up for metastatic disease to the lung from a musculoskeletal primary.
- Variant 2 addresses modality and timing of follow-up for metastatic disease to bones from a musculoskeletal primary.
- Variant 3 addresses timing of follow-up for local recurrence.
- Variants 4, 5, and 6 address modality for follow-up in osseous tumors without hardware, osseous tumors with hardware, and soft-tissue tumors, respectively.

Clinical Condition: Malignant or Aggressive Musculoskeletal Tumors

Variant 1: Timing and modality of follow-up for metastatic disease to the lung from musculoskeletal primary. *Caveat: This presumes an average

"hazard rate" for recurrence; individual variations (e.g., histologic evidence of tumor at margin, etc.) may mitigate this choice.

Radiologic Exam Procedure	Appropriateness Rating	Comments
Lungs: Modality for Baseline Examination		
Chest X-ray	9	
Chest CT	9	
PET-FDG	No Consensus	Data are encouraging but limited for evaluation at this time. Need to revisit when more data become available.
Lungs: Modality for Follow-Up Examination		
Chest X-ray	9	
Chest CT	9	
PET-FDG	No Consensus	Data are encouraging but limited for evaluation at this time. Need to revisit when more data become available.
Lungs: Timing of First Postoperative Examination		
3-6 months postoperative	9	
>6 through 12 months postoperative	2	
Only if symptomatic	2	
>12 months postoperative	2	
Lungs: Frequency of Follow-Up		
Every 6-12 months	9	
Only if symptomatic	2	
Every year	2	
Every 3-6 months	2	
Lungs: Duration of Follow-Up		
10 years	8	Long-term studies not available to indicate duration of follow-up with current chemotherapy regimens. Data are encouraging for future evaluation.

Radiologic Exam Procedure	Appropriateness Rating	Comments
5 years	3	Follow-up should extend to 5 years or greater. Recommend leaving to clinician's choice.
1 year	2	
2 years	2	
3 years	2	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1=Least appropriate 9=Most appropriate		

Abbreviations: CT, computed tomography; PET-FDG, positron emission tomography fluorodeoxyglucose

Variant 2: Timing and modality of follow-up for osseous metastatic disease from musculoskeletal primary. *Caveat: This variant seeks to determine if and how follow-up should occur for osseous metastases.

Radiologic Exam Procedure	Appropriateness Rating	Comments
Modality for Detecting Osseous Metastatic Disease		
Bone scan	9	
Whole body MRI	3	Whole body MRI or PET-FDG may supplant bone scans in future. Currently lacking sufficient data.
PET-FDG	3	
Radiographic survey	2	
Bone Metastasis: Timing of First Examination		
Only if symptomatic	9	
3-5 months	2	
6-11 months	2	
>12 months postoperative	2	
Bone Metastasis: Frequency of Follow-Up		

Radiologic Exam Procedure	Appropriateness Rating	Comments
Only if symptomatic	9	
Every 3 to 6 months postoperative	2	
>6 months to 12 months postoperative	2	
>12 months postoperative	2	
Bone Metastasis: Duration of Follow-Up		
Only if symptomatic	9	
1 year	2	
2 years	2	
3 years	2	
5 years	2	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1=Least appropriate 9=Most appropriate		

Abbreviations: MRI, magnetic resonance imaging; PET-FDG, positron emission tomography fluorodeoxyglucose

Variant 3: Timing of baseline, frequency of follow-up, and duration of follow-up for local recurrence.

Radiologic Exam Procedure	Appropriateness Rating	Comments
Timing of Baseline Exams for Local Recurrence		
Postoperative evaluation at 2-6 months	9	
Postoperative evaluation at 1 month	2	
Postoperative evaluation at > 6 to 12 months	2	

Radiologic Exam Procedure	Appropriateness Rating	Comments
Postoperative evaluation at 12 months	2	
Only if symptomatic	2	
Local Recurrence: Frequency of Follow-Up		
At 6 months or before 9 months	9	
At 9 months or before 12 months	2	
At 12 months or before 18 months	2	
At 18 months or before 24 months	2	
Only if symptomatic	2	
Every 3-5 months	2	
Local Recurrence: Duration of Follow-Up		
0 years	2	
1 year	2	
2 years	2	
3 years	No Consensus	Insufficient data to recommend specific length of follow-up. In absence of clinical signs, 3 years follow-up may be sufficient; 10 years follow-up would be conservative. Decision left to individual case driven by hazard rate relating to grade of tumor and margins of resection.
5 years	No Consensus	
10 years	No Consensus	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1=Least appropriate 9=Most appropriate		

Clinical Condition: Malignant or Aggressive Musculoskeletal Tumors

Variant 4: Osseous tumor, without significant hardware present; imaging modality follow-up for local recurrence.

Radiologic Exam Procedure	Appropriateness Rating	Comments
Plain radiograph	9	
MRI		
MRI with or without contrast	9	
MRI with dynamic contrast study	2	
PET-FDG	3	Data are encouraging for future evaluation.
US		
US	2	
US with color Doppler flow imaging	2	
CT		
CT with or without contrast	2	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1=Least appropriate 9=Most appropriate		

Abbreviations: MRI, magnetic resonance imaging; PET-FDG, positron emission tomography fluorodeoxyglucose; US, ultrasound; CT, computed tomography

Variant 5: Osseous tumor, with significant hardware present; imaging modality/modalities for follow-up.

Radiologic Exam Procedure	Appropriateness Rating	Comments
Plain radiograph	9	
US		
US	5	When significant hardware is present. Plain radiograph with US should be considered. Dependent on local expertise.
US with color Doppler	5	

Radiologic Exam Procedure	Appropriateness Rating	Comments
flow imaging		
MRI		
MRI with or without contrast	3	When metal-reducing sequences become available, MRI may become more useful in presence of significant hardware.
MRI with dynamic contrast study	2	
CT		
CT with or without contrast	3	Usefulness depends on type and extent of hardware.
PET-FDG	No Consensus	Still unproven, early data very encouraging for future.
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1=Least appropriate 9=Most appropriate		

Clinical Condition: Malignant or Aggressive Musculoskeletal Tumors

Variant 6: Soft-tissue tumors; presume no significant hardware; imaging modality/modalities for follow-up.

Radiologic Exam Procedure	Appropriateness Rating	Comments
MRI with or without contrast	9	
Plain radiograph	5	
US		
US	4	Depending on local expertise, may be an alternative for MRI.
US with color Doppler flow imaging	4	
CT		
CT with and without	2	

Radiologic Exam Procedure	Appropriateness Rating	Comments
contrast		
PET-FDG	No Consensus	Still unproven, early data very encouraging for future.
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1=Least appropriate 9=Most appropriate		

Specific types of imaging for follow-up for local recurrence will depend on the site of the original tumor (osseous vs. soft tissue), as well as the type of therapy used (curettage with bone graft vs. resection with allograft vs. soft-tissue resection, all taking into account the presence or absence of hardware). Comments related to each of these situations are presented in the original guideline document.

CLINICAL ALGORITHM(S)

Algorithms were not developed from criteria guidelines.

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The recommendations are based on analysis of the current literature and expert panel consensus.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Appropriate selection and timing of radiologic exam procedures for follow-up bone tumors, soft-tissue tumors, and suspected metastasis post therapy

POTENTIAL HARMS

None stated

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

An American College of Radiology (ACR) Committee on Appropriateness Criteria and its expert panels have developed criteria for determining appropriate imaging examinations for diagnosis and treatment of specified medical condition(s). These

criteria are intended to guide radiologists, radiation oncologists, and referring physicians in making decisions regarding radiologic imaging and treatment. Generally, the complexity and severity of a patient's clinical condition should dictate the selection of appropriate imaging procedures or treatments. Only those exams generally used for evaluation of the patient's condition are ranked. Other imaging studies necessary to evaluate other co-existent diseases or other medical consequences of this condition are not considered in this document. The availability of equipment or personnel may influence the selection of appropriate imaging procedures or treatments. Imaging techniques classified as investigational by the U.S. Food and Drug Administration (FDA) have not been considered in developing these criteria; however, study of new equipment and applications should be encouraged. The ultimate decision regarding the appropriateness of any specific radiologic examination or treatment must be made by the referring physician and radiologist in light of all the circumstances presented in an individual examination.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Living with Illness

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

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ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

1998 (revised 2002)

GUIDELINE DEVELOPER(S)

American College of Radiology - Medical Specialty Society

SOURCE(S) OF FUNDING

The American College of Radiology (ACR) provided the funding and the resources for these ACR Appropriateness Criteria™.

GUIDELINE COMMITTEE

ACR Appropriateness Criteria™ Committee, Expert Panel on Musculoskeletal Imaging

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Panel Members: B.J. Manaster, MD, PhD; Murray K. Dalinka, MD; Naomi Alazraki, MD; Richard H. Daffner, MD; Arthur A. DeSmet, MD; George Y. El-Khoury, MD; John B. Kneeland, MD; Helene Pavlov, MD; David A. Rubin, MD; Lynne S. Steinbach, MD; Murali Sundaram, MD; Barbara N. Weissman, MD; Robert H. Haralson III, MD

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

It updates a previously published version: Follow-up examinations for bone tumors, soft-tissue tumors, and suspected metastasis post therapy. American College of Radiology. ACR Appropriateness Criteria. Radiology 2000 Jun;215(Suppl):379-87.

The ACR Appropriateness Criteria™ are reviewed after five years, if not sooner, depending upon introduction of new and highly significant scientific evidence. The anticipated next review date for this topic is 2007.

GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the American College of Radiology (ACR) Web site.

Print copies: Available from American College of Radiology, 1891 Preston White Drive, Reston, VA 20191. Telephone: (703) 648-8900.

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on May 6, 2001. The information was verified by the guideline developer as of June 29, 2001. This summary was updated by ECRI on May 22, 2003. The updated information was verified by the guideline developer on June 23, 2003.

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